Michigan Department of Environmental Quality
Water Bureau
Guidance for the Evaluation of Existing Storage Structures
December 2, 2005

This guidance is being provided to assist in the preparation and review of applications for the general permit for Large Concentrated Animal Feeding Operations, NPDES Permit Number MIG019000. This guidance is intended to clarify certain provisions of Part 31 of the NREPA and provide information to encourage consistent administration of these provisions. It is not intended to modify the provisions of Part 31. Should there be any apparent inconsistency between this guidance and the statutory and administrative rule requirements, the language in the statute and rules should obviously guide staff decisions.

This guidance specifically addresses Part I, Section A.4.a.2)b)B) Structural Design – Existing Storage Structures. This part of the permit reads as follows:

B) Existing Storage Structures

i) In a permit application for coverage under this permit the applicant shall either:

(1) Provide documentation through an evaluation by a professional engineer that each storage structure is constructed in accordance with NRCS standards, set forth in Conservation Practice Standard No. 313, Waste Storage Facility, dated June, 2003, or

(2) For each storage structure, demonstrate environmental performance equivalent to NRCS standards, set forth in Conservation Practice Standard No. 313, Waste Storage Facility, dated June, 2003. The demonstration shall be accomplished through an evaluation by a professional engineer. Applicants verified under the Livestock System of the Michigan Agriculture Environmental Assurance Program (MAEAP) may submit the "Evaluation of Existing Components" for review by the Department. After review of the evaluation, the Department will notify the applicant if additional information is necessary to complete the application.

ii) If the applicant cannot provide the documentation or demonstration required by (1) or (2) above, the applicant may request that the COC specify a date by which the permittee shall provide storage structures that attain (1) above, but that date shall be no more than three years after the COC issuance date.

This part of the permit allows for two options in the permit application; to either document that the NRCS standard is achieved, or to demonstrate that environmental performance equivalent to the NRCS standard is achieved. Details for the documentation option are contained in A.1 and A.2 below. For the demonstration option suggestions are provided in B below. , An additional option for applicants verified under the Livestock System of the MAEAP is provided in C below.

A. Documentation of existing storage structure(s) meeting NRCS standard 313.

The permit application should address both construction (1) and current operating condition (2).

1. Provide documentation through a professional engineer that each storage structure was constructed in accordance with NRCS Conservation Practice No. 313, Waste Storage Structure, dated June 2003. This documentation should address the following items which are in the NRCS 313 standard.
    a. Considerations for the potential failure of waste storage pond liner (page 10 of 313 standard)
        i. Are any of the conditions in Table 6 present?
        ii. If yes, indicate how they are addressed (see suggested options in the NRCS standard).
    b. Location (page 1 of the standard):
        i. Not in floodplain or If in floodplain, properly protected
        ii. No field tile within 50 feet
        iii. Properly isolated from drinking water wells
    c. Service Life and Durability (Page 4 of standard)
        i. Minimum service life of 10 years
        ii. Determine initial service life, where the structure is in age relative to the initial service life, and the expected remaining service life
    d. Determine seasonal high water table (page 4)
    e. Subsurface investigation (page 4)– required for all waste storage structures
    f. Additional Criteria for Storage Ponds Page 5)
        i. Soil and foundation – the pond shall be located in soils with an acceptable permeability and meet all applicable regulations, or the pond shall be lined.
        ii. Design bottom elevation – no lower than 2 feet above the seasonal high water table. If documentation is not available or suitable, evaluate a minimum of three locations surrounding the structure to determine if the pond bottom is at least 2 feet above the seasonal high water table.
        iii. Liners (page 5) – no self sealing ponds. See the standard for details on Compacted Earth, Flexible Membrane, Bentonite, Concrete, and Natural Clay Base liners.
            1. For compacted earth liners - Voids within the liner are to be refilled with Bentonite chips or equivalent

            a. When documentation does not exist conduct a soils evaluation by sampling side slopes at least every 100 linear feet using the Unified Soil Classification System (ASTM D 2487 or ASTM D 2488)

- Plasticity Index (PI) must be of at least 15 and classifies as CL, CH, MH, SC, or GC

b. Measure liner and pond side soil cover thicknesses. Both liner and cover should be an average of 1-foot measured perpendicular to the finished surface

c. Conduct permeability testing of liner using undisturbed core samples. A minimum of two permeability tests shall be taken from side slopes to demonstrate liner permeability rate. Core samples shall be taken from the middle third of the side slope. The permeability should be 0.0028 ft/day (1 x 10 -6 cm/sec) or less.

2. For a natural clay base liners - When documentation does not exist determine the minimum liner thickness below the design bottom elevation (should be at least 10 feet), and conduct soils evaluation based on Unified Soil Classification System by sampling side slopes at least every 100 linear feet and the bottom every 10,000 square feet.

- Plasticity Index (PI) must be of at least 15 and classifies as CL, CH, MH, SC, or GC
- Voids within the liner are to be refilled with Bentonite chips or equivalent

iv. Outlets (Page 6)– only manual release of storage allowed
v. Minimum top widths (Page 6)– see Table 2
vi. Excavations (Page 6)– no steeper than 2 horizontal to 1 vertical unless supported by a soil investigation

g. Additional Criteria for Fabricated Structures

~~i.~~

i. Design bottom elevations (Page 7) – No lower than seasonal high water table. If documentation is not available or suitable, evaluate a minimum of three locations surrounding the structure to determine if the pond bottom is at or above the seasonal high water table.

ii. Liquid tightness (page 7)– In accordance with standard engineering and industrial practices

h. Plans and specifications (page 10): Supply support data documentation as listed in 313.

2. Conduct an Inspection of the existing storage structure to determine if the structure is in good operating condition. Observe and document the following for the specific liner as follows:

- All structures:

- Evaluate inlets, agitation points, and pump out locations for damage to liner or structure
- Evaluate the side slopes for erosion and liner damage
- Evaluate storage embankments for excessive woody vegetation (more than 6" high), presence of burrowing animals, and soft soils or leakage at the toe (outside bottom of embankment).

❖ Concrete liner – at least 2/3 of the side slope must be visible and clean
  - □ Look at side slopes for significant cracking
  - □ Vertical cracking equal to width of 1 mm is ok
  - □ Not more than 1 crack per 20 feet
  - □ No horizontal cracking is allowed

❖ Fabricated structures
  - □ Conduct visual inspection on exterior and interior
  - □ Walls appear to be vertical – no bowing
  - □ No significant cracking
  - □ No horizontal cracking is allowed
  - □ Determine adequacy of and describe concrete floor and wall support.
  - □ In the instances of precast concrete tanks or slurry store where NRCS pre-approved standard requirements are used, obtain letter from design company.

B. For each storage structure, a study/evaluation/etc. may be conducted to demonstrate environmental performance equivalent to NRCS standards set forth in Conservation Practice No. 313, Waste Storage Structure, dated June 2003. The equivalent environmental demonstration shall be conducted by a professional engineer. This demonstration should address the items that could not be addressed in A above.

C. For applicants verified under the Livestock System of the MAEAP, you may submit the "Evaluation of Existing Components" as this portion of your application for review by the Department. It is suggested that as much information as possible be submitted with this evaluation to help address the items identified in either the documentation or demonstration options described above. The Department will review the evaluation and information submitted, and notify the applicant if additional information is necessary to complete this portion of the application.